

## Unlocking Satisfaction: A Conceptual Exploration of Technological Proficiency and its Effects

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### Abstract

This research is poised at the nexus of technology proficiency and its impact on the life satisfaction among the elderly population in Jinan, particularly in the face of rapid digital advancements. The problem statement hinges on comprehending the extent to which technology proficiency influences the satisfaction levels of older adults. The primary objectives are to dissect the multifaceted relationship between technology proficiency and life satisfaction, whilst identifying the variables that act as facilitators or barriers in this interaction. A notable gap exists in the literature concerning the specific needs, limitations, and preferences of the older population in the context of technology use, especially in a localized setting like Jinan. Employing rigorous quantitative methodology, data will be analyzed utilizing Statistical Package for the Social Sciences (SPSS) and Structural Equation Modeling (SEM) through Analysis of Moment Structures (AMOS) to scrutinize the underlying relationships between the key variables. The expected findings are anticipated to shed light on a generally optimistic association between technology proficiency and life satisfaction among the elderly, underlined by certain key facilitators like intuitive technology interfaces and strong familial and social support networks. However, challenges such as cybersecurity vulnerabilities and complex, non-intuitive design of certain technological platforms could potentially act as deterrents. The implications of this study are manifold, emphasizing the urgent need for more inclusive, user-centric designs and robust security infrastructures in technology tailored for older adults, thus contributing to policy and practice in gerontological digital literacy. In summary, this research endeavors to provide a nuanced understanding of how technological proficiency could be harnessed effectively to enhance life satisfaction among the elderly in Jinan, while addressing the pertinent challenges that come in the way of realizing this potential.

**Keywords:** Technology proficiency, Satisfaction, Elderly, Conceptual

**Introduction**

The escalating global aging trend has elevated it to a critical global issue. As per a 2019 report from the United Nations (UN) (UN, 2019), the worldwide population aged 60 and above reached a milestone of 1 billion and is forecasted to expand to 2.1 billion by 2050, constituting 22% of the overall global populace. By the close of this century, this percentage could exceed 30%. The elderly often confront amplified obstacles in assimilating and utilizing technology, attributable to factors such as limited physical capabilities, unfamiliarity with innovative technology, and reluctance to accept new systems (Deary et al., 2009). Given the increasing relevance of technology in everyday life, a growing concern is the impact of technological proficiency on satisfaction among the elderly. This statement opens up a realm of inquiries and considerations surrounding the dynamics of technological adoption among older adults. The transformation brought about by digital technology transcends various facets of life, making it a quintessential element for enhancing the quality of life, especially among the aging population who may find themselves grappling with modern technological advancements. The problem at hand extends beyond the surface level issues of digital literacy. It infiltrates deeper into the realms of emotional and psychological well-being, which could be significantly impacted by one's ability or inability to navigate through the digital world efficiently. This leads to our problem statement: What is the influence of technological proficiency on the satisfaction levels of older adults? The challenge is not merely the unfamiliarity with modern technology but also the extent to which this proficiency, or lack thereof, affects the psychological and emotional satisfaction experienced by seniors. Understanding the correlation between technological proficiency and satisfaction among seniors is crucial, as it has far-reaching implications on how technology is designed, developed, and delivered to cater to the elderly demographic. Some research indicates that older individuals frequently face hurdles due to their relatively diminished expressive and technological competency, leading to challenges in comprehension, operation, and diminished satisfaction (Niehaves & Plattfaut, 2014). Hence, comprehending the extent to which technological proficiency impacts satisfaction levels among the elderly could unveil insights that are instrumental in tailoring technological solutions that are both efficacious and user-friendly for the aging populace.

Research Objectives and Questions:

RQ 1: What is the influence of Technological Proficiency on Satisfaction?

Objective 1: To identify the influence of Technological Proficiency on Satisfaction among the elderly.

In this dynamically advancing technological epoch, the assimilation and endorsement of technology serve as crucial determinants in molding diverse societal sectors. The elderly demographic, constituting a significant portion of the global populace, finds itself at an interesting yet challenging juncture within this landscape. The burgeoning influence of digital technology across various facets of life denotes a critical paradigm shift, necessitating a thorough investigation into how the elderly navigate this digital wave. The interplay between technological proficiency and satisfaction among seniors cannot be overstated, as it carries profound implications for their overall quality of life and societal inclusiveness. This study aspires to probe into the captivating interplay between technology proficiency and satisfaction among seniors actively involved in multiple fields, hence magnifying the essence of our problem statement: What is the influence of technological proficiency on the satisfaction levels of older adults? The quintessence of this inquiry lies not just in understanding the disparities in technological adoption among the elderly, but in deciphering

how these disparities translate to varied levels of satisfaction or dissatisfaction. The hurdle extends beyond mere digital literacy; it encompasses the broader spectrum of digital inclusivity and the resultant impact on emotional and psychological well-being. As the world veers towards an increasingly digital milieu, ascertaining how technology adoption and proficiency influence seniors' satisfaction becomes an urgent focal point of this investigation. The overarching objective of this study is to delve deeply into the multi-faceted implications of technology proficiency for older adults, focusing especially on how proficiency or reluctance to use new technologies correlates with their overall life satisfaction.

### **Literature review**

#### **Positive Effects of Technology Proficiency on Satisfaction Among the Elderly**

Research consistently demonstrates that ease of use is key for the elderly to accept and utilize new technologies (Alsswey & Al-Samarraie, 2020). Ease of use includes not just intuitive user interfaces but also lower cognitive load and simpler operational steps. A streamlined technology experience directly enhances satisfaction among the elderly as it reduces the chances of encountering problems or difficulties during usage (Etemad-Sajadi & Gomes Dos Santos, 2019). The role of friends and family is indispensable in the elderly's proficiency of new technology. This social support not only helps them overcome initial fears and anxieties but also offers a secure environment for them to freely explore and use new technologies, thereby increasing their satisfaction (Özsungur, 2022; Wang & Wu, 2022). Pathways from proficiency to satisfaction are bridged by self-efficacy. Individuals with higher self-efficacy are more likely to believe they can successfully use new technologies, thereby becoming more satisfied in the process (Zhou et al., 2019). Technological proficiency is closely tied to improvements in quality of life. New technologies can assist the elderly in tasks ranging from shopping and health management to social interactions, making these tasks more convenient and satisfying for them (De Cola et al., 2020). Numerous studies have identified a positive correlation between technological proficiency among the elderly and their life satisfaction. For instance, a study conducted by Talantis et al (2020) suggests that improving the elderly's technological proficiency not only helps them adapt to a rapidly evolving modern society but also enhances their overall life satisfaction. Similarly, research by Wang et al (2011) found that seniors with a high level of technological proficiency reported a higher level of satisfaction and improved quality of life. Furthermore, a study by Anderberg et al (2019) revealed that the elderly who are proficient in using modern technologies tend to experience less loneliness and enjoy better social connections, contributing to higher life satisfaction. Besides the aforementioned factors, there are multiple other variables and limiting factors such as cultural background, economic status, and health conditions that could affect technological proficiency and satisfaction among the elderly (Sen et al., 2022). Therefore, future research should consider these factors more comprehensively to more accurately understand the relationship between technological proficiency and satisfaction among the elderly.

#### **Negative Effects of Technology Proficiency on Satisfaction Among the Elderly**

According to studies by Guner and Acarturk (2020) as well as Syed-Abdul et al (2019), while technology offers conveniences, complex user interfaces and operational steps can increase the cognitive load for the elderly. This cognitive stress could not only reduce their proficiency in technology but also diminish their satisfaction while using these technologies. Additionally, research by Day et al (2020), emphasized the correlation between intuitive user interfaces

and the degree of technology acceptance among older adults. Research by Yu-Huei et al (2019) and Nguyen et al (2020) suggests that the advent of new technologies could pose social challenges for older adults. As they may not be familiar with how to utilize social media or instant messaging tools, this could lead them to experience social isolation, further lowering their life satisfaction. In a related vein, Hofer et al (2019), investigated the social implications of digital illiteracy among the elderly, underscoring a noticeable impact on social inclusion. Baudin et al (2020) and Shareef et al (2021) discuss how economic factors impact the elderly's proficiency and satisfaction with technology. Financial pressures from having to purchase new devices and services could be a significant factor in their negative attitude towards new technologies. Expanding on this, Kasar and Karaman (2021), illustrated the financial constraints as a prominent barrier to technology adoption among the elderly demographic. Reports by Liu et al (2021) indicate that excessive or incorrect use of new technologies can lead to health issues among the elderly, such as eye strain, neck, and back pain, all of which could reduce their satisfaction levels. In alignment with this, Heponiemi et al (2020), probed into the physical challenges faced by elderly individuals while interacting with modern technological gadgets.

According to Saare et al (2019) and Lee and Kim (2020), cultural background and psychological barriers are also factors affecting technology proficiency and satisfaction among the elderly. In some cultures, older adults may feel that using new technologies is inappropriate or undignified, which can lower their proficiency and satisfaction rates. Additionally, Patel et al (2020), delved into the cultural nuances influencing technology acceptance and usage among older adults, shedding light on the psychological hurdles faced by this group. In summary, the literature suggests that while new technologies have their merits, there are also a range of factors that could negatively impact the elderly. Therefore, when considering how to improve technology proficiency and life satisfaction among the elderly, these negative factors must be taken into account comprehensively. This section now encapsulates a more elaborate portrayal of previous research endeavors, which not only substantiates the discussed issues but also provides a broader context for the analysis at hand.

### **A Comparative Analysis of the Pros and Cons of Elderly Individuals' Technological Familiarity**

Technologies such as smartphones, smart home devices, and telemedicine services have made life easier for the elderly. According to Alsswey and Al-Samarraie (2020) and Etemad-Sajadi and Gomes Dos Santos (2019), these technologies provide unprecedented access to services and information, improving their overall quality of life. As Özsungur (2022) points out, social media and video-calling platforms can offer older adults a vital social outlet, reducing feelings of isolation and loneliness. Further supporting this, a study by Cyr et al (2021) showcased how the use of digital communication tools helped mitigate feelings of loneliness among the elderly during the COVID-19 pandemic. Moreover, Yousaf et al (2020) illustrated the ease with which seniors can control their home environments using smart home devices, thereby enhancing their independence. On the contrary, Wojciehowski et al (2021) highlighted the challenges some elderly individuals face when interacting with modern technology, which could potentially negate the perceived benefits. Wearable devices and apps allow continuous health monitoring. Wang and Wu (2022) suggest that such technologies can lead to better health outcomes by allowing timely interventions. In a similar vein, Valera Román et al (2021) demonstrated the effectiveness of wearable technology in managing chronic conditions among older adults. On the other hand, research by Jang et al

(2021) highlighted the privacy concerns associated with continuous monitoring, which might deter some elderly individuals from adopting such technologies. Guner and Acarturk (2020) found that complex interfaces could deter the elderly from adopting new technologies. The cognitive load can reduce their overall satisfaction and potentially discourage ongoing use. Echoing this sentiment, studies by Spence et al (2019) emphasized the need for more user-friendly interfaces to promote broader adoption among this demographic. Although technology can aid in social connectivity, it can also result in isolation if not used correctly, as indicated by Yu-Huei et al (2019). The high costs of some devices and services can be burdensome for older adults, as discussed in Saare et al (2019) and Lee and Kim (2020). Adding to the financial constraints, Thompson et al (2020) highlighted the added cost of digital literacy programs required to effectively use these technologies.

### **Preferences of the Elderly Regarding New Technologies**

According to Briede-Westermeyer et al (2020), elderly users prefer technologies that are easy to use, with intuitive interfaces. This coincides with the general preference for less cognitive load, as previously mentioned in Guner and Acarturk (2020). The sentiment is echoed in studies by Nguyen et al (2020), which emphasize the need for intuitive design to enhance usability for the elderly. Similarly, a study by Kasar and Karaman (2021) highlighted that simplified interfaces can significantly improve the technology adoption rates among older individuals. Elderly individuals often have physical limitations like reduced dexterity or visual impairment. Gessl et al (2019) found that they prefer technologies that take these limitations into account, like voice-activated devices or large-screen interfaces. Supporting this, research by Sen et al (2022) illustrated that voice-activated technology can be particularly empowering for elderly individuals with mobility issues. Additionally, Yousaf et al (2020) demonstrated that large-screen interfaces can aid in mitigating the challenges posed by visual impairments. Fosch Villaronga and Poulsen (2020) point out that older adults are increasingly concerned about their digital security and privacy. As such, technologies with robust security measures are favored. Adding to this discourse, a comparative analysis by Cook et al (2021) revealed that trust in digital security significantly impacts the willingness of elderly individuals to adopt new technologies. Similarly, a study by Cyr et al (2021) highlighted the crucial role of privacy assurances in fostering technology acceptance among the elderly. According to Meng et al (2020), older adults enjoy technologies that can be personalized to meet their unique needs, improving their overall satisfaction with the technology. This notion is further reinforced by Lee and Coughlin (2015) which both found that personalized technologies can significantly enhance user satisfaction and overall user experience for elderly individuals, thus promoting a more inclusive digital society.

### **Technology Acceptance Model**

The Technology Acceptance Model (TAM), originally proposed by Fred Davis in 1989 (Marangunić & Granić, 2015), has been an instrumental framework in the field of information systems and technology adoption (Lee et al., 2003). TAM initially sought to explain users' acceptance of information systems by focusing on two critical constructs: perceived usefulness and perceived ease of use (Marangunić & Granić, 2015). These constructs have been widely employed to study technology adoption in diverse populations, including the elderly and across various industries (Guner & Acarturk, 2020).

TAM posits that perceived ease of use and perceived usefulness are the primary determinants of technology acceptance and usage. The model is further divided into two:

Perceived Ease of Use; referring to the extent to which an individual believes that using a particular technology is effortless or straightforward. Perceived Usefulness which relates to the belief that using technology will enhance an individual's job performance or overall well-being. Intelligent systems such as technologies related to artificial intelligence, robotics, machine learning, etc. open new insights into data and expand the concept of work in myriad domains (Vorm, E.S. & Combs, D.J., 2022). In the manufacturing industry, elderly individuals' satisfaction with technology may be influenced by their perception of how easy it is to use and whether it improves their work or daily tasks.

The influence of technology acceptance on satisfaction among elderly people in various industries is a complex and evolving topic. Age, generational differences, health factors, and industry-specific trends all play a role in determining how elderly individuals adapt to and accept technology. ICT plays a major role to improve inclusion of various parts of the society (such as children, disabled citizens, and elderly) into daily life (Guner & Acarturk, 2020). As technology continues to advance, it is essential to address these factors and develop tailored solutions to ensure that elderly individuals can fully participate in the digital world and derive satisfaction from it.

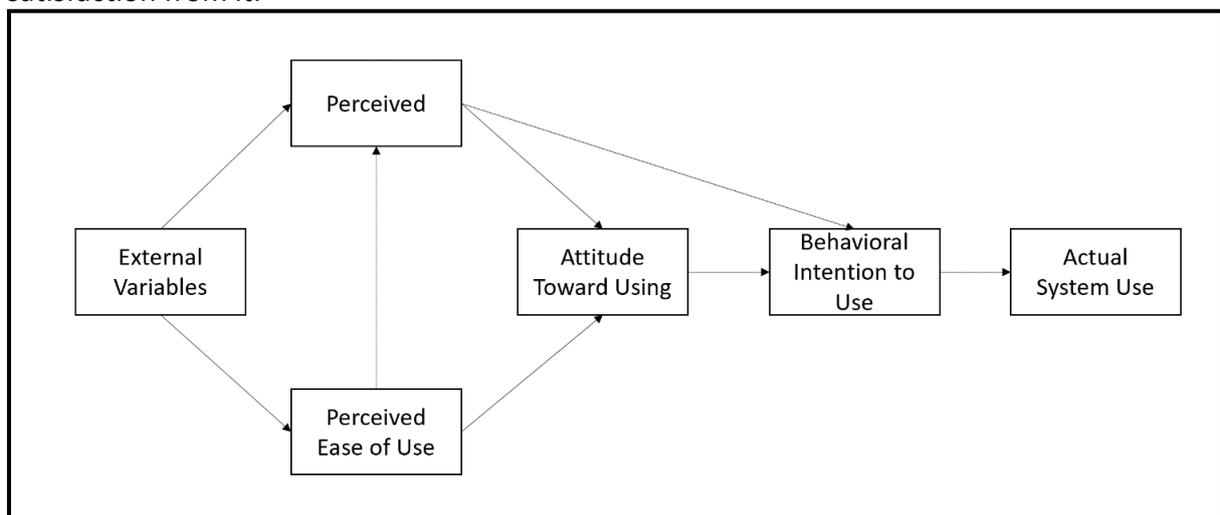


Figure 1, Technology Acceptance Model

Source: Marangunić & Granić, 2015

### Frameworks of the study

In this study, we adopt an integrative theoretical framework to deeply explore the satisfaction levels of the elderly population in adopting and using technology. Central to our framework is Technology Proficiency as the independent variable, a concept derived from the well-regarded Technology Acceptance Model (TAM), extensively utilized to elucidate how users come to accept and use new technologies. The original TAM model employed two key constructs—Perceived Ease of Use and Perceived Usefulness—to gauge the degree to which users are willing to accept technology. However, in our adapted framework, we pivot towards a more generalized notion of Technology Proficiency, which encapsulates a broader range of factors affecting the elderly's engagement with technology. In addition to Technology Proficiency, we introduce 'Elderly' as a moderating variable. This demographic is the focus of our research due to its unique needs and challenges—limitations in physical capabilities, unfamiliarity with new technologies, and hesitancy to adopt new systems, to name a few. This moderating variable allows us to delve deeper into how the elderly population is particularly impacted by technology proficiency and how these, in turn, further affect their satisfaction

levels. Finally, our model uses 'Satisfaction' as the dependent variable. Satisfaction here is not just an outcome of technology proficiency but might also be influenced by a variety of other factors such as cultural background, economic status, and digital literacy. However, by integrating Technology Proficiency and the special moderating variable of the elderly population, we aim to explore and quantify how technology proficiency directly or indirectly impacts the satisfaction levels of the elderly. Through this comprehensive framework, this study hopes to provide a nuanced and specific lens through which to better understand how the elderly adopt and utilize technology, and how this process affects their levels of satisfaction.

### **Methodology**

In order to delve deeply into the manner in which technology proficiency influences user satisfaction among the elderly population, a robust quantitative methodology was put into action. Our methodology is structured around the collection and analysis of primary data, which necessitates a well-designed, structured questionnaire to gather pertinent data from the targeted demographic. The study targets individuals aged 60 and above, who are retired, residing in Jinan. A sample size of 500 respondents was chosen to ensure statistical validity and reliability while providing a comprehensive insight into the research variables. An online questionnaire was employed as the primary data collection tool. The questions were meticulously crafted to elicit precise responses regarding the participants' level of technology proficiency, their experiences, and satisfaction levels concerning technology usage. The survey was disseminated through various online platforms that are frequented by the elderly community in Jinan City, Shandong Province, China. Additionally, local community centers and retirement associations were contacted to spread the word about the survey, encouraging eligible individuals to participate. The collected data was analyzed using SPSS and AMOS, which facilitated rigorous statistical testing. Various statistical techniques were utilized including descriptive statistics, correlation analysis, regression analysis, and structural equation modeling to explore the relationships between technology proficiency and user satisfaction. Measures were taken to ensure the validity and reliability of the data collection tool. The questionnaire was subjected to a pilot test among a small group of the target population to refine any ambiguous or misleading questions. All respondents were briefed on the purpose of the study, and their consent was obtained before participating in the survey. Anonymity and confidentiality of the participants were maintained throughout the research process. Through this rigorous quantitative methodology, we aim to derive meaningful insights that will not only contribute to the existing body of knowledge but also provide actionable recommendations for enhancing the technological proficiency and subsequent satisfaction among the elderly population in Jinan City, Shandong Province, China.

### **Conclusion and expected finding**

The principal objective of this manuscript was to elucidate the multifaceted relationship between technology proficiency and life satisfaction within the geriatric population. Through an extensive analysis encompassing various domains such as usability, social support mechanisms, and psychological constructs like self-efficacy, the study predominantly corroborates a favorable influence of technology proficiency on the subjective well-being of older adults. Key facilitators underlying this positive interaction include the intuitiveness and simplicity of technology interfaces, which reduces cognitive load and enhances user experience. The role of familial and social support networks has been found to be

indispensable in ameliorating initial barriers to technology adoption, subsequently fostering an environment conducive to explorative learning and, hence, greater satisfaction. Psychological self-efficacy also serves as a significant mediator, shaping an individual's confidence and perceived capability to successfully navigate new technologies, which in turn amplifies satisfaction levels. Our expected findings are that the geriatric population would exhibit an enhanced level of life satisfaction with increased technology proficiency, provided there are adequate support systems in place to guide them through the initial phases of technology adoption. Additionally, a user-centric design approach that caters to the specific needs and limitations of this demographic is anticipated to significantly boost technology acceptance and utilization, consequently leading to improved life satisfaction. On the basis of these findings, we recommend that technology developers and stakeholders engage in a more user-centered design approach, ensuring that new technologies are easily accessible and intuitive for older adults. Moreover, the provision of sufficient familial and social support, alongside community-based educational programs on technology use, would be instrumental in overcoming initial adoption barriers. Ensuring robust cybersecurity measures are also critical to alleviating concerns related to privacy and data security, which would, in turn, foster a more trusting and conducive environment for technology utilization among the elderly.

However, it would be imprudent to neglect the inherent challenges and obstacles that technology presents for this particular demographic. Concerns such as cybersecurity vulnerabilities and the often complex, non-intuitive design of certain technological platforms could potentially undermine the accrued benefits, warranting the imperative for more inclusive, user-centric designs and robust security infrastructures. Additionally, the study discerned considerable heterogeneity in technology preferences among older adults, which suggests that a monolithic approach to technology design and implementation is suboptimal. Rather, tailoring technological interventions to cater to the specific needs, limitations, and preferences of the older population could yield more efficacious outcomes. In summation, while the proclivity for technology proficiency among the elderly constitutes a promising avenue for enhancing life satisfaction, the relationship is nuanced and influenced by a variety of mitigating factors. Therefore, a multi-dimensional, multi-disciplinary approach is exigent for a more holistic understanding and exploitation of this consequential relationship.

This research bridges a pivotal gap in existing literature by providing a comprehensive examination of the intricate relationship between technology proficiency and life satisfaction among the elderly. Theoretically, it offers an integrated framework that combines usability, psychological constructs, and social dynamics, advancing our understanding of how technology interacts with the multifaceted lives of older adults. Contextually, the findings highlight the pressing need for tailored technological solutions and educational programs to support the aging population. By underscoring the nuanced challenges and potentials, this study paves the way for stakeholders, from tech developers to policy makers, to create more inclusive, effective, and secure digital environments for the elderly, thereby significantly contributing to the broader discourse on aging in the digital age.

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